

AVIATION WEEK

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JULY 17, 1950



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U.S. Pat. 2,411,111
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BOEING

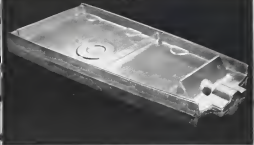
19 YEARS

FAFNIR

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NEWS DIGEST

DOMESTIC

FAAADA margin was taken into court last week by opponents of the deal following reports that CAB members negatively voting against the anti-passenger were under strong pressure to change their decision. AKA's exploit fighting their company's sale to FAA joined with Schenck & Western Airlines in obtaining an order in U. S. District Court for the District of Columbia restraining the four remaining CAB members in their efforts from issuing an order or opinion in the North Atlantic route transfer case other than the decision in opinion originally proposed by them and transmitted to President Truman.

Republic XF-86 completed Phase One flight tests at Edwards AFB a little less than a month after its first flight to 28 days, company pilots flew the prototype derivative of the F-84 D-19 from its speed, altitude, range and stability tests. USAF pilots have begun Phase Two flight.

First F-50 production model completed initial flight at Edwards AFB. Northrop is building 100 of the all-weather interceptors for the Air Force.

Hudson International Aviation Awarded the 1948-49 design and to James H. Donahoe (inventor), Jacqueline Cochran (inventor), and Vice Admiral Charles E. Rosendahl (inventor). Capt. Charles Yeager, last supreme pilot, and the late Capt. Geoffrey de Havilland, who was killed in an attempted supersonic flight, received domestic medals for outstanding service.

Paul A. Schwabert was the North Atlantic States meeting called at El Paso, N. Y., in a surprise of his own design.

Dr. Eric Walker will become executive secretary of the Research and Development Board Aug. 1, succeeding Dr. Robert F. Bunch. Walker will be on leave from Pennsylvania State College where he is director of the offshore research laboratory and head of the domestic engineering department.

Rear Admiral Hugh H. Goodwin has been named acting chief of Navy's research, replacing Vice Admiral Russell S. Bellamy who is retiring.

Seward AFB, Newburgh, N. Y., has been designated headquarters for the newly formed Eastern Defense Command. It will be the control center for the East Coast network of radar aircraft

warning stations. The network will be based on a \$101 million construction program.

Widow of a TVA navigator who was killed through the airplane opening of a Constellation in March, 1947, secured a \$47,500 settlement in U. S. District Court, New York. The suit was based on the death on the High Seas Act of Mar. 10, 1923, which says, in part, that death on the high seas from "a wrongful act" is cause for action. CAB had found that the airplane was structurally strong and properly maintained.

Ball Aircraft Corp. workers, who last year staged a 28 week strike, walked out for several days only this month. President of Local 501, UAW, said the men back to work without calling a strike, although protesting the company's labor relations policy.

Three persons to fall from a plane in flight in recent months was James A. Trotter who fell to his death over Virginia from an Douglas A-1 Skyraider C-46 loaded from Newark to Miami. The steward of the plane reported Trotter was crumpled near the door when it opened.

FINANCIAL

Northrop Aircraft closed its third quarter, Aug. 30, with a \$101 million backlog of which 90 percent was in military orders. Prior to deliveries the additional losses on C-124R tanker transports and before adding expected loss on aircraft, unrecorded earnings for the first nine months were \$3,945,146, said Oliver F. Eichel, board chairman and general manager. Loss on the tanker above that provided for in 1946-49 is anticipated at \$1 million. Some of it may be written off if the company gets additional C-124 orders.

INTERNATIONAL

Royal Air Force has given the name "Whitlark" to the Boeing B-29 bombers received from the U. S.

ECR has approved a plan shortly for the Americanization of Chrysler Renault, previously owned French firm. The deal will buy four used DC-4s, 22 open Pratt & Whitney engines and spare parts from Princeton International Airways. The transaction of 1943, 1946 is valued, 1953, 1954 being ECR funds (E.C.R. which formerly operated) to the U. S., is being liquidated. Chrysler Renault will operate the planes between France and French overseas territories.

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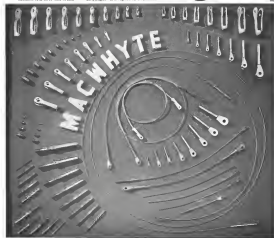
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WHO'S WHERE

In the Front Office

A series of administrative moves in the Caters-Wright organization has brought Eugene Lacey to the corporation as a consulting engineer, Henry W. Strong to fill the vacant office of Charles H. New, president, and Harold H. Woyles has been named general manager of the Pipeline division. Lacey, previously vice president of relations of the N. Y. South Western, Prior to this he was with the N. Y. Herald Tribune and N. Y. Times. Strong takes the place of Joseph E. MacDonald, who resigned on the weekly editorial staff of publication of C.W. He came to C.W. in 1945 from Arthur Andersen and Co. Woyles replaces E. Elmer Martin, recently resigned, and will handle sales and service of all Pipeline division products, including pipes and fittings, rocket motors, and electronic flight simulators and trainers. He is also general manager of the division's institutions department (see also page 14).

Alexander T. Boston has been named to fill the newly created post of aid to the president, coordinating sales and customer relations for North American divisions, but Boston moved to NAA's eastern up to Washington for most part. This position is now being held by E. W. Viger, who joined the company in 1951.

Joan N. Reilly has joined Northeast Airlines as aid to president. Reilly is slated to represent NEA in aviation industry and international affairs and will also cooperate in the airline's business relations. C.A. Perry is now vice president of the up with American Airlines, and executive vice president of Airfreight Inc.

Changes

Robert G. Ely has been named director of public relations for Frontier Airlines. Robert G. Ely has been appointed to the newly created post of aid to chief engineer for Republic Aviation Corp. A. A. Ross Harkiss is now director of sales research for Delta Airlines, Inc.

Honors and Elections

Leonard S. Hubard, vice president of Northeast Airlines, has been elected chairman of the General Committee of the International Air Transport Association. John L. Collier, chairman and president of B. F. Goodrich, received an honorary degree of Doctor at Case at Western College, Ohio. United Air Lines' medical director C. A. D. T. T. M.D. has been installed as president of the American Medical Association. Newly elected president of the Board of International Air Transport Association is E. W. Viger, who joined the company in 1951. E. W. Viger, who joined the company in 1951.

D. E. Ward, chairman of the Board of International Air Transport Association, has been elected to a four-year term as council president of the International Civil Aviation Organization.

INDUSTRY OBSERVER

Specifications selected by Institute and Foreign Commerce Committee for standard commercial transport needs under the 512-500-hp category testing NF new engine. Some action on the study is due to those of Chase Aircraft's NC-121. The committee specifies a seven-place with a 10,000-lb payload capacity, 200-mph cruising speed, and 3000-hr range, also specifies cargo compartment, low belly and easy loading. NC-121 now having aerodynamic-delayed installation at Light AFB, Fla., along with two other transports, meets the committee's order about without deviation.

As the first, with a "universal" interest in tactical support aircraft, a military industry and in developing a fighter-bomber capable of close ground support activity. Design specifications developed by USAF fighter section call for a subsonic fighter with a 10,000-lb payload, 45,000 ft. ceiling, 250-mph range, with heavy emphasis on machine gun, rocket and bomb armament. Although intended in a new design, USAF is willing to examine conversion possibilities of an existing fighter. Douglas A-1H transport aircraft plane currently capable of approximately 950 mph could meet this specification with improvements.

USAF is preparing for modifications both of existing aircraft in anticipation of increased production of existing fighter and bomber types, and with a new design (jet-engine fighter and bomber) which will be only subsonic in the National Guard, Air Force and 100,000 fighters. USAF has 6300 planes in storage, of which about 1000 are of the B-29 class. Reminders are utility, light bomber and fighter types. After discussing is scheduled to get under way by Sept. 1, but members involved several open world matters on that date. Several discussions scheduled have been set up.

Navy's parallel test center at El Centro, Calif., now operating at about one-half capacity, has been designated Joint-Potential Test Center. USAF had wanted to establish its own 512-million setup at El Centro because of Navy's short (7000 ft.) runway but was forced down. Department of Defense decided that if heavy bombers such as B-7 and "subsequent models" needed joint-battle tests, those planes could be tested at El Centro. The decision, it is estimated officially, will use U. S. approximately \$3 million annually.

Glenn L. Martin Co. delivered the first 202A to Trans World Airlines last week. Second, in its test now and will be delivered at the end of the month. Twelve have been ordered "on loan" pending delivery of the 4-14. Company officials are considering buying 2-22As and making the 4-14 order a new and separate contract.

The General Transport being built for Allison div. of General Motors to use in research work on Allison engines is scheduled for test flight about Aug. 15. Following extensive tests, the plane, with a 4-ft. wide, 4-ft. high cargo door, will be used in a cargo demonstrator to achieve D. is scheduled ultimately for GMI executive transport duty.

Spencer and one of the fastest executive airplanes sold to an individual business man without government subsidy is the executive Cessna 441. This one has just been purchased by Henry Ford III. It is the second executive plane of that type that Cessna has sold. First one went to Jerry Parnell, Mexican baseball player, who wanted it after some use to Athletics Inc., Cessna subsidiary. The Ford plane, however, is not the former Parnell plane.

Consolidated Vultee's giant NC-99 four last week at Kelly AFB, Tex., after being grounded for nearly a year to reach over from Pratt & Whitney 3000 hp, to 1500 hp engine. Delay in test flight was caused by electric electronic, electric explosion in previous test beds during processing the flight last year. The 21,000-lb, 400-passenger transport will be turned over to Strategic Air Command following completion of flight tests. As a strategic air transport it can move 100,000 lb of cargo approximately 4000 mi. non-stop.



Joseph J. O'Connor, Jr.

agency. He took office in April, 1945, six months after the conflict had ended, and spent extremely busy hours on 1947 operations. With the help of staff personnel, the career edged into the black in 1948 and showed a substantial profit last year.

► **Head With Reserve**—Difficulties are not shared only with Rep. John Roney, chairman of a House Appropriations subcommittee, say two strong-fibered O'Connor's detractors in the Free CAR. During appropriate times, however, Roney showed great interest, toward O'Connor and attacked CAR's efficiency.

As a result, the House signed \$221,000 from CAR's budget—more which would have required extensive personnel cuts. The Senate Appropriations Committee recently voted to reduce \$600,000 of the cut.

O'Connor's resignation also left vacant the chairmanship of the Air Commanding Committee, the group that's part aviation policy group.

Korean Sum-Up

USAF analyzes action:
too much distance, and
too few planes.

As the Korean conflict moved into its third week the Far East Air Force found itself still hampered by a general lack of air craft and inadequate logistic supply, especially in too limited an operation by the short range of its jet fighter planes, poor weather and its enemy force so dead that targets on which to plan its bombs and rockets were difficult to find.

► **Tom Gumpert**—At the current Air Force declared that it had five combat groups in the Far East theater. These include one medium bomb group (B 29), 5 fighter groups (F 86 and F-51), one all-weather group (F-51), two light bomber groups (B-24) and one troop carrier group (C-47). Additionally Air Force maintained a few weather reconnaissance squadrons and an air rescue unit.

This foreign force was charged with the job of defense of all areas under its control in the Far East. Air Force, HEAF continues the defense of Japan and its long string of islands, Okinawa, Guam and the Philippines.

► **Encounter**—Fugate—Encounter had divided U S Army, Navy and Air Force in a second main defense force. As a result a plan faced with the Korean conflict the Air Force was unable to move fighter and bomber forces to the Korean front without expending its Japanese, German and Philippine defense strength.

As the battle moved in its first phase, Air Force found itself conducting an air war with but few fighter planes available on the immediate front lines. Most of these with the exception of a few North American F-51 Mustangs were Japan based Lockheed P-51s.

► **The Mustang**—The P-51, even with the recently installed wing tip tanks, is under 5000 mi. With the little low speed capacity 450 mi. was approximately the distance between Washington and Dayton. Given the P-51, even in a perfect weather, it was not in short five minutes combat time over the battle area.

In the early stages of the war Air Force measure was to protect and convey transport aircraft and out of Korea existing dependence and rely on critical supplies to Korea. As this phase drew to a close Air Force began actual support operations in weather and stability provided. Mustangs were in tactical support operations beyond ground completely during each stage of the conflict. Not until the last few days had tactical support been of much real assistance in ground troops. This was due generally to complete lack of air-ground communications. Could tactical support of ground troops depends entirely upon having air controllers who were with the ground troops and spot enemy ground and air activity for the forward forces.

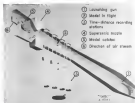
► **Continued**—Until U S Army troops came in battle in Korea was unable to carry out operations in the forward line. Improved communications was all that was lacking. Now as controllers are a factor in vector Air Force combat planes to the specific areas where needed.

As equipment and troops have moved into Korea, position, strategy, area, passed and lost brought in for the P-51. This should permit later stages of the jet fighters over the battle area. However, high Air Force officials point out that very likely the P-51 will be held in reserve in case the Communists need additional fighters from Korea. ► **Mustangs**—Since the battle for the time being will be done by World War II process P-51s which currently hold

the air as U S troops dragging them to the front line. The P-51s are as Air Force has ordered an unlimited quantity of North American P-51s to the front from the United States. These planes are being taken from the National Guard. But few many are to use via Navy carriers in a check-pointed secret but at the last counting the National Guard had 935 P-51s, 25 F-51s and 17 P-51s in operation.

► **False Reports**—Air Force success say in the last few days the reports that the F-86 is capable of indefinite ground support "without assistance of ground support." The P-86, and nearly all other current production jet fighters are able to operate successfully with down speeds of 20,000 engine engine planes. It can also stand Army ground support needs. Range has been the area limiting factor. High Air Force officials say that

USAF is satisfied with its present equipment with adequate to quality, not quantity. The position leaves this action difficulty in Korea in two-fold. Logistics and the sequencing of an increase in the Korean peninsula. Such an increase would Army engineers. Budget-based accounts have provided extreme aerial logistics supply and actually prevented establishment of an Air Transport Division.



CUTAWAY of NACA supersonic tunnel



CFR and lower inside blocks of 14-in. supersonic tunnel.

Tunnel Gives Mach 8 Test Speeds

Two new research tools to probe the air's hypersonic phenomena were announced last week by the National Advisory Committee for Aeronautics at the National Symposium of Aeronautics Laboratory, Moffett Field, California.

Visitors who attended the symposium were told that the new research tool, a jet-powered flight speeds have made even greater the development of new series of aircraft with which to drive more mobile and more sophisticated information.

► **First Flight**—The cutaway of the new flight tunnel, known as the supersonic jet-flight wind tunnel. Basically, that is a subsonic of the quiet cross-section of the flow, in which the air is which moves a gun into still air and data are measured from a series of high speed photographs.

NACA has introduced a new tool by adapting the ballistic range to fire its model into the flow of a gas at supersonic speeds of two to three times the velocity of sound.

This high wind is generated in the source vessel of the 17-in. diameter gun which discharges the test model. High pressure air from the oxygen plant through a series of valves, a jet engine, nozzle, test section, diffuser and out into the open air.

► **Shooting**—Gifford's gun launcher is located in the diffuser section, aimed

for optimum. Gifford's available range from 22 in. on up to 3 in.

Model models, rather than bullets, are fired from a plastic shell which is fired inside a gun and then which along the projectile and fills the hole of the gas which backs out from the nozzle after leaving the nozzle. After passing through the test section, which is 18 in. long, two feet wide, and one inch wide, the models are caught by a steel cylinder containing camera water.

► **Diff. Recording**—The position between the ballistic range and the jet-flight tunnel extends to the method of data recording used here. As the model passes through the test section, it is taken a series of photographs of the model which record a time difference history of the flight in shadowgraph images and chronograph readings.

Drag, of course, is measured directly, with a windmill to develop techniques for measuring lift and moment, generally done by attaching the model to hatching and observing the sensitivity in flight.

► **Chart**—Very small, the model is fired from the gun, the velocity high density of the air in the tunnel makes very high Reynolds' number available. For example, a model as small as 1/8 in., tested at a Mach number of 7, would correspond to its 92-in. diameter at the same speed and at an altitude of

100,000 ft. For contrast, NACA says that to get the same results in a conventional wind tunnel would require a 10-ft long model.

► **How Fast—Right now**, test speeds of Mach 8 are obtainable, with a future potential of Mach 15. Equipment is being provided which will permit these kinds of speeds. (As a matter of interest, this means that after the tunnel wind speed must be measured, in the tunnel velocity of the launcher must go up, or perhaps both. Gifford's experts can still learn more new ways in achieving high speeds velocity.)

► **Another Feature**—Several of NACA's facilities at a 16 x 14 in. supersonic wind tunnel, intended for use over the speed range from Mach 3.7 to Mach 7.

► **Major difficulty** in providing higher and higher Mach numbers has been the need for more power in getting of direct pressure into across the nozzle. NACA engineers that by using an unconventional diffuser which would decrease the air in the test section and then expands again. The diffuser efficiency is increased further by using boundary layer sweeps just downstream of the throat in order to stabilize the flow out of the diffuser.

Using this technique, the pressure ratio required to drive the tunnel at Mach 7 is reduced to 36 from its rated value of about 200.

NACA is operating both free jet facilities for its research in a wide field of basic aerodynamic phenomena.



B-29 CLIMBS WITH FOLDED BOWS

A. Fawcett HBP-1 result in aircraft with folded wings in flight to the right side of the carrier U S S. Fawcett in notes of the carrier's director. Recent Marine use of the jet engine to capture a touchdown being underway at Okinawa was viewed with

interest by President Truman. Military interest in return would surely be more sharply. They are being considered possible applications in gliders and fueling more. Transport because of their flexible structure. Navy's HBP-1, all would be

placement for HBP-1, and the USAF's P-51, a similar case for such work, as likely Fawcett candidates for each position, as are the Sikorski HO4S (Navy HO4S) and B-29. Air Force would not be ordered by the Navy.

The pilot, with nothing to do as he actually flying the plane was concerned, could devote his entire time during these critical moments of the approach to other details.

On three passes at the field, the F7C was buzzed off below 100 ft on each case. As Doug Henthough, Eclipse Power sales engineer, commented, "Five right over the same checklist every time." One could see why the CAA DC-3 did not meet any of its 140 approaches.

Eclipse-Power does not anticipate that use of flight path control will reduce maximum ceilings below 100 ft as the invisible barrier. But R. A. Malherbe, chief of CAA's federal airways flight inspection division, allowed 500 approaches to continue through localizers to a full stop with the plane under constant F2-10/F7C control.

► **Altitude Control**—Directions of auto meter altitude control is an aspect to the F2-10 not documented in a recent CAA flight from Chicago to Washington. The device held the plane at 8000 ft except for one anomalous rise to a mean variation of 25 ft.

Disconnection of auto control is automatic when the pilot calls for a change in altitude with the pitch control knob or the F7C glide path equalizer auto system. An interlocking mechanism does the trick.

► **Pitch Invariant**—An added restriction is the failure of automatic approach systems in the jet's need to avoid fuel containing "poisonous" and get on the ground at once as possible at destination.

For evidence of increased acceptances of the F7C, which costs approximately \$4000 with throttle control, Eclipse-Power points to three operators who at the time of this article were being taught or were testing the system.

► **SA Fawcett**, two instructors with flight instructor, in progress on Canada flight.

► **A. V. Roe Canada Ltd.**, test article two on the C103 Jetstar.

► **CAA**, two instructors in operation on DC-3 and 11 more scheduled all with throttle control.

► **Canada's Department of Transport**, one instructor DC-3 equipped, has throttle control.

► **Delta Air Lines**, one DC-6 equipped, has throttle control.

► **Northeast Airlines** two Boeing Stearman equipped but not authorized. One experimental installation with throttle control expected this month.

► **United Air Lines**, one DC-3 equipped, no throttle control.

Eclipse-Power believes it won't be long until there are others, says that CAA has set the pace.

Wax Rain Repellent Is Effective

Canadian product keeps windshields clear without optical distortion; inexpensive and easy to apply.

Aircraft windshields shed water effectively when treated with PC-10, a newly developed rain repellent produced for that purpose by PC-10, a paint made up of specially purified waxes, was demonstrated by Dr. D. F. Jordan of the Applied Physical Chemistry Dept., National Research Council of Canada and is now licensed under license by the Dow Corning division, Pittsburgh Canada Ltd., Toronto. U.S. distribute is the Royal Air Corp., 415 Phoenix Ave., Irvine, Calif., N.J.

► **Highly Effective**—A recent demonstration at LaGuardia Field, New York, testified to PC-10's effectiveness. One half of the left windshield of a Cessna 170 was treated with the product and the engine started in smoggy rain conditions during flight. A heavy stream of water was directed at the rest of the windshield. From a distance the wipers, visible through the untreated portion of the windshield, were completely obscured and distorted by a heavy film of water, the view being largely obscured. Though the treated portion, visibility was virtually unaffected, hangars and airport personnel could be clearly seen from above, even clearly without distortion. PC-10 does not become wet.

Now position can be drawn from the two following sample reports.

► **Trans-Canada Airways Co.** Flight through heavy rain with C-46. "Visual aid through treated portion was 3.5 times with an apparent optical distortion. Visibility through untreated portion was less than 300 ft, with total optical distortion."

► **Trans-Canada Airways Co.** Ltd. Flight made with a Cessna 170. "The 75 foot clear through light was shown at speeds of 400 and 450 miles per hour. The rate of the front panel to which the pilot had been applied was greater than and visibility was about two miles through it. The way at the panel, without pilot application, was opaque."

► **Properties**—D. C. B. Miller, Manager of the Dow Corning division, stated that PC-10 was unique in that it contributed to air safety without offsetting the disadvantages of adhesive performance or increasing weight of the aircraft in which it was used.

Visual characteristics are claimed for the repellent.

► **It is optically invisible** and introduces no optical distortion.

► **It is effective on glass or transparent plastics**—the latter, whether on large



RAIN IS KEPT from hitting right side of F2-10 windshield applied by Dr. Jordan

removed and deep scratches become less evident after treatment.

► **Unaffected** by deicing glycols or alcohols.

► **Application** is easy and quick and can be done before or after rain or during it.

► **On** deicing or deicing glycols do not remove the film.

► **All materials** are non-polluting, non-toxic, non-corrosive and do not damage paint, dope, fabric or plastics.

► **It** inhibits accumulation of dirt, light icing and ice water accumulation.

► **It** averages, used like an anti application, one year.

Dr. Jordan pointed out that use of PC-10 largely eliminates the two types of optical difficulties encountered when flying through rain.

► **Poor visibility**, when small objects such as other planes, power lines and flag poles are obscured by rain on the windshield, and reflection occurs, where objects appear to be lower than they actually are, more apparent on the windshield as it passes and lower the lighter rain area in the pilot's vision as it wags at angle. This can get a 200 foot visual range in half a mile.

► **Rain Repellent** Kts-PC-10 is available in kit form, with one containing cleaner brush for glass or plastic, hand pump to hold the wax in the windshield, the wax repellent wax pump hand sprayer pump, special application pads, modified application tips, and personal instruction to show where repellent has been applied. One kit, containing enough material to treat 15 average size windows, costs \$13.95.

Dr. Jordan feels that the product will be indispensable with the use of jets where windshield wiper installations are their effectiveness due to high speeds.

In J33 Turbo-Jets the hottest job goes to INCONEL



The J33 Turbo-Jet powers Lockheed's famous P-40 "Thunderbolt" latest combustion chamber design fully cooled engine life and reduce maintenance costs

It takes a tough metal... an extremely corrosion-resistant and heat-resistant one... to survive the white-hot blast of burning jet fuels.

That is why the designers of the J33 Turbo-Jet chose Inconel® for burner barrels. And why Inconel is used as the metal reinforcement in the insulation blankets on the J33 tail cone.

Inconel... unique among corrosion alloys... withstands temperatures up to 2000°F and is remarkably resistant to both hot and cold corrosion. It is harder and stronger than structural steel, yet readily weldable. Welds in Inconel are as heat- and corrosion-resistant

as the parent alloy itself.

Because of these "light-back" qualities, Inconel has proved to be the answer to some of aviation's toughest high-temperature problems... engine exhaust systems, burner combustion chambers, and turbochargers, for example.

Where even greater heat strength is required, Inconel X® offers properties never before obtainable in a practical, easy-to-buy metal.

If you would like more information about Inconel or other heat-resistant alloys... or if you would like help with a specific metal problem... write to our Technical Service Department.



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Bridgeport Upholstery Fabrics are so constructed that they can be rolled up to 90% space.



Bridgeport Upholstery Fabrics are available in many colors and weaves to suit your plane interior. When the simple switch and complete details.



Specify Bridgeport Air Seat, Back, Armrests, and Windows.



NEW AVIATION PRODUCTS



These units are designed for remote sensing temperatures in rotating assemblies, or wherever direct measurement of surface would be required. The response time is particularly fast, suitable for use in hundreds of aircraft engine places.

These thermocouples detect speed response of these thermocouples is more times that of previous models and that they can be used where temperatures reach 3000 1900 F and over.

Shipped up speed is attributed to:

- Most of the last pattern is considerably reduced in size, 14- and 20-gauge types.

- Thermocouples now are shaped to form a loop close to the hot junction, and insulation is laid about not much from the welded joint, reducing resistance.
- Decreases of the loop permit it to fit tightly inside a well, fastening itself to metal contact and clamping dead air space.

The response is also that in addition to higher speed response, thermocouples also are equipped by new heat-welding techniques.

Avionic Component

A development of interest to manufacturers of avionic equipment is a small rotary type phase converter produced by Emerson Air Devices, Inc., Bradbury 57, N. Y.

Over 10 cc. unit is a little larger than a cigarette pack, being 3 1/2 in. long and 2 in. in diameter. It converts single-phase, 400-c cycle to three-phase, 400-c cycle.

It is particularly suitable as a component in gyroscopes, synchros, vector units, frequency control circuits, control systems and other electronic equipment, according to the maker.

As a similar device, output voltage of this unit is a function of the load and power factor. But for power factors ranging from 100 to 50 percent, a balanced three-phase output can be obtained for a given load condition. Company says the PHE can deliver as high as 150 w with tolerance not exceeding 10 percent.

Where actual load is less than is necessary for balanced output, conditions, the company recommends what it terms "a simple and conservative method" to obtain balanced output.

Resistor networks connected in delta or wye may be used on the output side of the converter to match the point of balanced output. By attaching these resistor networks in voltage dividers, a suitable and balanced voltage output can be obtained.

Resistor networks, size, weight and balanced output, that raw and the its heat stability, low life and high efficiency, the firm adds.

New Thermocouples

Extremely fast response to temperature change is the outstanding feature of a new line of thermocouples developed by the Bureau Instruments division of the Minneapolis-Honeywell Regulator Co., Wayne and Roberts Ave., Philadelphia 44, Pa.



Speeds Breaker Tests

A new test unit designed to test break and simplify testing of circuit breakers has been developed by Schaffner Air Industries, Inc., 1715 15th St. N., Long Island City 1, N. Y.

This unit, designated Model 47, enables technicians to check out circuit breakers while they remain installed in the aircraft. Until recently, breakers had to be removed and shop tested.

The new tester will check performance of all aircraft breakers up to and including those of 110 amp rating. Except for a 110v, ac, power source, the unit is completely self-contained.

It is equipped with all necessary accessories, controls, operating manual book, a change component containing high and low capacity loads and a controlled power cord. To test smaller circuit breakers, separate low capacity test connections are included.

The device is widely being used by Lockheed Aircraft Service, Inc., at New York International Airport.

FINANCIAL

Will CAB Alter Interchange Views?

Examiner's recommendation of EAL transcontinental route may break trend toward equipment interchange.

The subject of equipment interchange may be given closer scrutiny as a result of a Civil Aeronautics Board decision.

A very difficult situation between Pan American Airways and Pan American Ginter Airways was settled recently in May, 1947, through the equipment interchange device. Previously, a lawsuit was lodged as to attempt to gain a CAB approval of the rights over the United States.

Foreign ownership was not certain to be divided equally between W. R. Grace & Co., Pan American and American Airlines, and Pan American. At that time, Pan American operated between Miami and the Canal Zone, and from New Orleans, Houston and Baltimore. Yes, to the Canal Zone, making connections at that point with Pan Am.

Pan Am also operates between Miami and Buenos Aires, by way of ports on the Caribbean and on the Gulf coast of South America. Foreign carriers between the Canal Zone and Buenos Aires via certain ports on the West Coast of South America. A direct route by Pan Am to a U. S. gateway would have created considerable trouble.

The great emphasis was on considering the industry's position by developing an existing partnership.

There have been isolated exceptions to this general philosophy—the current proposal extending from the West Coast may be in this category.

Among the various factors involved to reduce the airline unit, equipment interchange, aircraft and route interchange have figured prominently at one time or another. Of these, the latter change arrangement appears to have the greatest flexibility and has been studied in a greater number than any of the other methods.

Four equipment interchange agreements—three domestic and one international—have been approved by CAB in recent years.

First, Agreement—United Air Lines and Western Air Lines—approved in 1945, CAB approved an equipment interchange agreement between TWA and Delta.

This transcontinental pact was the first of its kind between airlines in the United States. It was made for through stops at Salt Lake City. With close timing of changing planes at Cincinnati.

point for passengers traveling between Los Angeles and points east or west of Salt Lake City.

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Passengers are no longer required to change planes en route as the Pan American Program arrangement. Thus, no other elements as well TWA form industry rule as respects as Delta's equipment while in its power. Various arrangements are in effect for the coordination of operations.

CAB approved an equipment interchange deal between Capital and National in April, 1947, providing service between New York and Los Angeles, through Washington. Operations under the arrangement, however, have not yet begun.

Delta America Post-In August, 1949, CAB approved equipment interchange between Delta and American at Dallas, Tex. This is the temporary interim stage that the CAB cannot yet grant the permanent status.

In the current proceeding, the case was presented that no statistical data have been made available as to the working of the American Delta interchange in regard to traffic flow, load factors, plane utilization and other elements. All of these factors will have a bearing on ultimate CAB action.

The ideal of free transportation system, from the standpoint of the traveling public, would provide one center single plane service between any two points in the U. S.

But the question of providing such a service through one carrier operation would be prohibitive. Through the device of interchange agreement by two or more carriers, one plane service could be established without the necessity of creating unnecessary juggling of operations.

Against Interchange—On the other hand, there are factors opposing such interchange deals.

• Safety element is involved due to differences in maintenance standards of planes used.

• Aircraft maintenance not under uniform of regulations enforced by one local agency and crew.

• Strikes on a participating carrier may affect the other party to the interchange.

• Choice of equipment may become a factor since it may be more expensive aircraft are introduced.

CAB in its action in the southern case proceeding, will shape the terms of new rule development—whether through further equipment or by regulations.

—Sally Mitchell



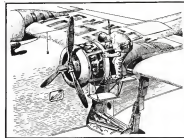
Albatross: Multi-Mission Amphibian

Sturdy craft is specially designed to fit needs of air rescue, transport, cargo and hospital services.

By Irving Stone

In the new Albatross, Grumman Aircraft Engineering Corp. has produced a rugged, high-speed craft aimed at

demonstrating the need for operating many types of planes in air rescue service. It is intended to "package" the characteristics of these planes (except the engine), and create without electronic (anti)



MAINTENANCE AIDS: Turboprops set into air on the water pumpplant serving, the new craft pond on each side of either engine drops down to give the mechanic a

convenient work platform for the accessory section. Engine access opening is used by portable platform which locks to front of accessory stand and uses steel aug.

turbo to protect any radio equipment in one today.

In addition to its suitability for rescue missions, the design is a one-part configuration which will allow it to perform:

- Amphibious operations
- Hospital functions
- Transport services
- Cargo handling
- Physiographic missions

And it is reported to be the first plane the Navy and Air Force have agreed upon under the Unification Program.

Experimental design was developed by the Navy. First flight of the experimental prototype (Navy NJR2F-1) was flown in Oct. '49. Second experimental (NJR2F-2) prototype flew about three months later.

First Navy-Air Force proposed procurement was initiated in February '48. This led to orders for 73 of the craft—1 for Navy, 61 for Air Force, 4 for Coast Guard. All construction is under Navy contract, and Air Force procurement is through the former's Unification. About 26 planes have been delivered to date—5 (JUF-1) to Navy, 20 (NJA-6G) to the Air Force.

The Navy version differs from the Air Force model only in that it has more structure in electronic equipment.

The basic similarity points up how Unification can pay off in a cost saving.

Both models are fabricated on the same production line.

Some handicrafts (pilot's, erection and

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THREE-VIEW aspect of Shetlan, showing the craft's principal dimensions.

Rear windows on either side of the hull are plate glass, for photographic work.

Powerplants are two Wright R-1820 T-6A single stage, two speed engines.

Propulsion are three-blade Hamilton Standard constant speed, reverse-pitch such. Oil supply for operating the props, independent of the engine oil system, is contained in the sump of each control console.

► Hull—The hull is designed to give a maximum of safety in a crash landing condition, so it is an open box.

Passenger seats and stowage structure are designed to withstand a maximum deceleration of 15g, and tests have shown that this condition will be met.

Hull is divided into six areas.

► Forward compartment, to carry various gear (stowage) and baggage (pass seats).

► Flight deck—pilot, copilot, radio operator.

► Main cabin.

► Auxiliary powerplant room.

► Landing.

► Tail compartment.

► Cabin. Detachable-Water-tight sub-pressure can be provided under main cabin floor so that cabin area will be crash-protected.

At rear of cabin on port side of the hull, near the water line, is a double entrance door sufficiently large to allow taking in a stretcher.

Bottom portion of the door hinges down into the cabin, while upper part then hinges up against the hull side. A higher reinforced or obtained with bottom portion secured in place.

A rescue platform may be lowered against the hull side of the door's bottom half for a crewman to be upon. Hull side is built to the side of the door opening, so can assist people to

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NEW

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for night
stratosphere
operation...
in all kinds of weather

F3D Skyknight, powered by two jets, is designed to reach high altitudes at extreme speeds for night interception of unfriendly bombers by radar in all kinds of weather.

Designed by Douglas for the U. S. Navy, the Skyknight is suited for various tasks aboard a carrier with little compromise of its basic role as an all-weather fighter.

High design efficiency permits the twin-jet F3D to fly at advanced speeds and over exceptionally long distances. This makes it adaptable as an attack fighter, long-range patrol or reconnaissance plane, or as a long-range fighter escort.

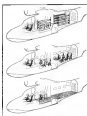
The Skyknight is another in the long line of dependable Douglas aircraft which have made the name "Douglas" world-famous for three decades.

EL SEGUNDO PLANT OF DOUGLAS AIRCRAFT COMPANY, INC.



DEPEND ON DOUGLAS

30th ANNIVERSARY YEAR



BULK MAKEUP. Rescue (top), transport (middle), cargo arrangement (bottom).

come aboard the platform.

Emergency door on starboard side is smaller than port side door and located higher above the water line.

Work doors can be used for oblique photography and for loading the sea anchor.

Overhead cargo hatch in the cabin, measuring 58 x 63 in., will accommodate passage of an R1530 engine as an overboard stowage.

These life rafts are crated—two are stowed upright on cabin floor below the emergency door on starboard side. The other two are crated typic—two in a compartment on top of the hull, all at wing rear spar. Release for this raft are installed in the cabin and on outside at hull top.

Each side door at the side of the hull contains fittings and an electric plug to accommodate a 10-amp, 1000-ft. thrust JATO unit on its outside. The unit may be installed on the deck from inside the cabin, and four switches mounted in the doors prevent firing unless both doors are closed and locked.

The expended JATO unit is jettisoned by a release lever on inside of the door. JATO unit may be stored below cabin floor, between wheel wells.

Antiskid Powerplant—This unit, using fuel from the plane's right main tank, is housed in a separate compartment aft of the rear cabin bulkhead, on starboard side. It delivers up to 16 hp continuously at sea level and down a generator, identical to those driven by the engines, to supply power to the ground when external power is not available and also in the event of main-engine generator failure.

Access to the tail compartment is through a door in the lavatory located on port side aft of the rear cabin bulkhead.

Stored in the tail are two parachute-type fuses supplying a maximum of

200,000 ohms. These are crated electrically fused circuit control and are fired from the front compartment.

Rescue platform, used to facilitate boarding at hull port door, is also stored in tail compartment.

Two oxygen systems are provided for altitude operation.

Crew system demand regulation (the pilot, copilot and navigator) are supplied by two bottles mounted forward of cockpit's ejection seats.

Passenger oxygen supply is from sea battery in the low compartment to continuous flow regulation. Cabin has 20 outlets for oxygen masks.

External outlets in cabin serve for

solid plugs of medical equipment, such as stretchers and heating pads. A hot plate may also be hooked in.

Wing-Airlock is comprised of a center section (bolted and sealed externally to hull) and external panels carrying fixed wing flaps.

Port water panel carries a solar heater, inboard of the flap.

Bomb rack under the wing also could accommodate a rescue boat and emergency padding equipment.

Fuel System—Each engine has its own fuel system, with crossflow connecting tank, electric valves so that both power plants can operate on any one tank.

(Continued on page 35)

Built to Take it on the Nose



The new Chase Aircraft XC-123 military transport employing a life guard of steel tubing to protect personnel in case of nose over or other accidents.

A typical example of how steel tubing can be used for strength—dependability and safety.

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Pan American pioneers radiotelephone network

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Site of Pan American's Collins 31M-2 VHF transmitting and receiving radiotelephone shipboard apparatus.

Below, left, for New Delhi, India, two Collins 31M-2 receivers tuned respectively to 3, 5, 8, 13, and 16 megacycles. Below, right, three Collins 31B-3 receivers and power supplies, for Bombay, Decatur, to operate on 4, 5, and 11 megacycles.



Collins 31B-3¹ control panels at London.



Collins 31B-2 2-5/2 kilowatt transmitter installed at London.



When Pan American World Airways opened a route into the Middle East in 1947, all on route plane ground communications had to be performed by radiotelegraph — the dot-dash system. A radiotelephone network, like that now in the United States airports, did not exist.

Today, through the initiative of Pan American, messages can be exchanged immediately by radiotelephone between Clipper pilots and ground radio operators over every foot of the Clipper routes from New York to Buenos Aires, and from New Delhi, India, continued around the world to San Francisco.

To accomplish this extensive pioneering job, Pan American has invested three years of work and a large sum of money. Then Collins has registered permission for radio stations with foreign governments, and has installed radio stations at a number of points in Europe and Asia. Pilots and ground personnel have been trained for the new operation, and the Clipper radio installations have been modified from radiotelegraph to radiotelephone.

The major radio units chosen by Pan American World Airways for this purpose are the Collins units, an Collins high frequency ground station and airborne transmitter and receiver. Installed on

Collins 31B-2 3-5/2 kilowatt *Antenna*¹ transmitters, RFF 30B-100 watt *Antenna*¹ transmitter and 31N receiver on the ground, and 150 transmitter-receivers in the air.

To complete the modernization of its *ROUND THE WORLD* system, Pan American has installed Collins 31B-2 and 16F transmitters, and 31N receivers, in radio stations at Santa Maria, Lisbon, London, Munich, Vienna, New Delhi, Calcutta, Bangkok, Manila, Honolulu, Los Angeles, San Francisco and Seattle, a 16F transmitter and 31N receiver at Vienna, a 16F transmitter at Damascus, and 31N receiver at Rome.

Additionally, a great improvement in ground radiotelephone service was made at Munich. There, VHF communications were selected from the airport to the top of 10,800-foot Mount Zugspitze in the Bavarian Alps, where a Collins 380A, very high frequency transmitting and receiving installation increases the effective operating radius from 50 to 200 miles, covering an area from Luxembourg to Milan, Italy.

The pioneering by Pan American World Airways is the best tradition of American free enterprise. Collins is proud to have been chosen to play a part.

¹ See U. S. Nav Day.

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Many tanks are located in wing center section between fuel and aux pipes, outboard of fuel. Each has a capacity of 516 gal. and is made up of three interconnected Nylon Bladders.

These are then filled (secured) to over-head structural members by a series of strap fasteners.

Tanks are vented by a non-leaking vent air stabilizer to provide a small pressure above the fuel to prevent oil collapse with gradual depletion of the contents.

A 100, 150 or 100-gal. drop tank can be installed under the center section on each bomb rack assembly.

And finally, aux. piping, aux. pressure tanks will boost the Alkathene fuel engine in each fuel holding 200 gal.

Access Features—Maintenance access is a prime consideration on the Alkathene Exemplar.

For overhead engine servicing, a crossover can come up through pilot's or copilot's escape hatch or through the aux. entrance door, over top of fuel to the wing. On either side of engine, a service panel can be designed to serve as a work platform and another panel, directly over the platform, could be any hatch to access.

An additional platform (normally stored in tail compartment) is supported by the secondary platform and over steel run ring to give a standing area for getting at the engine power section conveniently.

The engine and oil system fuel, and cooler can be shown out as a unit by removing four bolts and one quick-disconnect plate fitting.

Four straps on top of wing center section permit hoisting of fuel for access to fuel bottom and checking gas operation.

All upholstery and soundproofing panels in the fuel are being with improvements. This gives quick access to electrical and other lines.

Tough Fuel Tank Displays Long Life

Sturdiness of World War II self-sealing fuel tanks has been strongly demonstrated by the performance of a fuel cell made in a early 1945 by the D. F. Condit Co., Akron, Ohio.

This tank, used as a forward landing edge unit, has been almost seven years at continuous service in a Lockheed P-15 without requiring repairs. It was temporarily removed last year, but only because damaged fuel intake tubes had to be replaced.

The P-15 is an early model "bullet-proof," said by Condit for development testing, which has been in continuous operation except for a six-month period after the war.



Try balancing a modern jet fighter!

In today's jet fighter planes, foot-pedal operation of the conventional flow fuel system and automatic fuel transfer for weight and balance control is an absolute necessity. The Bristol Cyclic Timing Control is the basis of this fuel distribution system as one of the newest high-performance jet fighters.

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GENERAL MOTORS CORPORATION
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Fairchild's portable runway for aircraft landing gear drop tests can simulate landing speeds up to 160 mph. Dore motor has apparently been secured for photo clarity.

Mobile Runway Simulates Landing

Fairchild development measures nose-wheel shimmy, tests crosswind and tracked gear in the laboratory.

Close simulation of actual aircraft landing conditions in laboratory drop tests is now made possible with a portable runway developed by the Aircraft Division of the Fairchild Engine and Airplane Corp.

The apparatus can be used to duplicate landing speeds and resulting drag and shock conditions at speeds up to 160 mph.

In operation, it is placed beneath landing gear to be dropped, it then replaces the platform and beam previously used for these tests. The device can withstand a maximum dynamic vertical load of 175,000 lb.

Truck Gear Used—Parts of the device in Fairchild's truck gear. The machine uses a pair of rubber belts from a B-50 landing gear, mounted from side-by-side over two rollers, and driven there with a 250 hp dc electric motor. Driven speeds range from 50 to 160 mph.

The belts may be changed in a matter of 15 min by removing a single bearing block, under one of the support frames.

Two portable components—power plant and speed-up—compress the 14,000-lb unit. Most of the supporting structure is aluminum alloy, although all rotating parts are made of steel for maximum flywheeling effect.

Research Uses—The major advantages of the Fairchild device are these:

- Set-up and dynamic springback loads can be simulated.
- Tracked landing gear, such as is used on the C-52, B-50 and B-36, can be drop tested satisfactorily.

• Crosswind landing conditions can be simulated.

These advantages were not present in the previously used techniques of inclined platforms used to introduce a four-and-a-half component of load on the landing gear or wheel penetration (used to simulate open up loads).

Fairchild points out that the most important feature of all the test device will be an laboratory testing of nose gear shimmy. This has been previously handled by the rather non-scientific method of towing a car, which mounted the landing gear under test, behind a ground vehicle. The shimmy was feasible when tailwind speeds were limited to about 60 mph, but current rates of better than 100 mph make such a method unsatisfactory.

Developed and built under an Air Force contract, the assembly was delivered to AMC at Wright-Patterson Air Force Base by way of contract, to a Fairchild C-119 Packet.

A-N Research

The Navy's Speed Device Center at Sand Point, L. I., N. Y., is studying on a co-sponsor in the person of the Army, according to announcements of the Departments of the Army and Navy. The Army will be interested in devices similar to the radar recorder for measuring the accuracy of anti-aircraft fire without resorting to actual firing, according to the Technical Data Dept. of the Central Air Documents Office.



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Cold Weather vs. Silicone Rubber

Material shows unexpected capabilities; designed for great heat, it stands up well to low temperatures.

Research has now established that silicone rubbers, though developed specifically for high temperature use, show good potential for extremely low temperature application.

This data, particularly pertinent for operation of control and capacitor order meter conductors or contact cold at high altitudes, resulted from a recent study by National Bureau of Standards researchers C. E. Wan, W. H. Leyer and L. A. Wood, under a joint Office of Naval Research and Quartermaster Corps project.

Because whereas certain their elasticity and electrical conductance at temperatures as high as 300 C., they are specially suitable for remote engine, fuel, and gauges and associated cables and sensors and other instrumentation of military rubber materials lose their elasticity at about -50 C., studies were made to determine the feasibility of silicone to serve on the cold side of the operating overhead, as well as on the hot.

► **Transition Temperature**—Lower limit of the temperature range in which all cases retain their characteristic elasticity was determined by locating the second order transition temperature—where a marked change occurs in the slope of the length-temperature curve.

Below this second order transition temperature, properties of the rubber are critically affected; the material taut, rag, or the characteristics of a solid. For practical purposes, even at temperatures somewhat higher than the transition value. NBS reports that a rubber is unsuitable where long range elasticity is required. Though silicone useful below -55 C., natural rubber has a second order transition temperature of -33 C.

► **Agreement Found**—For thermal in position measurements, small rubber disks were placed between two quartz interferometer plates. Change in temperature under the disks contract or expand, affecting plate distance and causing the interference fringes to the eye-piece to move relative to a reference.

Number of fringes passing the observer point were recorded as temperature was varied slowly from -195 to 100 C.

The silicone rubbers were all commercial products. Two were pure gas siloxanes containing fillers and reinforcing agents. And another was particularly reticulated for low-temperature service. With all, only small differences in transition temperatures were noted, indicating that fillers and reticulation

had little effect on the second order transition value.

Behavioral agreement also was noted between two products designed for high temperature use and those reticulated for low temperature application.

One low temperature product was particularly significant. Its transition curve was actually lower than 100 to approximately -120 C. (second order transition temperature), but below that better value, coefficient of thermal expansion was considerably less—more nearly that of a rigid solid.

► **Crystallization Action**—Second order transition for the other silicone was also approximately -120 C., but in cooling from room temperature, a first order transition was noted at values varying from -85 to -75 C., appearing at fast passage past the reference point of a large number of fringes while temperature was raised, and a reverse rough, indicating a considerable decrease in volume with partial crystallization.

This crystallization produces some stiffening—apparently preventing, says NBS, the successful use of silicone below below this temperature.

However, NBS believes that the product showing no first order transition should have good possibilities for service down to -100 C.

On liquids, the partially crystalline material, swelling occurred over range of temperatures, considerably above those required for crystallization—a condition analogous to that shown by solid materials. Upon crystallization, swelling, volume change of the pure gas silicone varied over a range of 2 to 7.9 percent. Expansion of the pure material between 0 and -35 C. was about 40 x 10⁻⁶/°C. For the solid ones containing fillers and reticulation, similar data were obtained, but values were lower because of these ingredients.

Vibration Study

In a run of but a few hours, a simple test setup which subjects aircraft control equipment to realistic vibration proved the equivalent jarring of 1000 hours flight.

Used at the aircraft department of Westinghouse's small motor division, Lima, Ohio, the test equipment re-creates a vibration spectrum, which can put out 36 to 1680 cycles per second.

High-speed camera recording of the run shows detailed effect of vibration on the test piece.

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Five Leduc Rotary Solenoid models are manufactured. Diameters range from 1 1/4 to 3 1/2 inches. Proportional motion up to 360° can be engineered to suit your product's requirements. Starting torques for 48" stroke range from 1/4 pound inches to 50 pound-inches.

We supply to quantity users and assist the opportunity to be of assistance in engineering a Leduc Rotary Solenoid to meet your product's requirements.

Model No.	Stroke	Weight	Starting Torque	Operating Torque
1	1/4"	1.5 lb.	1/4"	1/4"
2	1/2"	2.5 lb.	1/2"	1/2"
3	3/4"	4.0 lb.	3/4"	3/4"
4	1"	6.0 lb.	1"	1"
5	1 1/4"	10.0 lb.	1 1/4"	1 1/4"
6	1 1/2"	12.0 lb.	1 1/2"	1 1/2"
7	1 3/4"	15.0 lb.	1 3/4"	1 3/4"
8	2"	20.0 lb.	2"	2"
9	2 1/4"	25.0 lb.	2 1/4"	2 1/4"
10	2 1/2"	30.0 lb.	2 1/2"	2 1/2"
11	2 3/4"	35.0 lb.	2 3/4"	2 3/4"
12	3"	40.0 lb.	3"	3"
13	3 1/4"	45.0 lb.	3 1/4"	3 1/4"
14	3 1/2"	50.0 lb.	3 1/2"	3 1/2"

Electrically actuated rotary solenoids are available in 115V AC and 24V DC. They are designed for long life and are protected against short circuits. They are also protected against overcurrent and overheat.



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Comet Maintenance Is Simpler

Serviceability level surprises even those in the know, heightening appeal of turbojet transport.

Maintenance cost of jet engines may well be less than for piston-engined craft, if the first 250 hours of operation with the Hawelland Comet is any criterion.

Opinion was voiced by Mr. Ben King, manager of the experimental department, writing as the current issue of the Hawelland Gazette.

Serviceability level, he says, has been a surprise even to those who thought they knew what to expect after seeing the aircraft grow from the design stage into the prototype.

►Pre-flight inspections—It is a matter of established routine at Hawelland that the Comet be ready for flight each morning at dawn. This has meant that the aircraft is inspected and prepared for flight the evening preceding, so that in the morning only a routine inspection need be made.

The crew for these maintenance inspections is made up of ten technicians, working under the chief flight chief superintendent: 3 are engine technicians, 2 electricians, 2 hydraulic specialists, and 3 "Etra-eggs."

Evening inspections normally include a tightness check of engine parts, observation of battery state of charge, and topping of the oil tanks. Electrical circuiting is checked, along with fuel tanks. Hydraulic reservoirs are topped, and the system checked for leaks. Battery lead is adjusted to the requirements of the up-morning flight test for the following day.

Such an inspection takes about two hours on the Comet, but because of the large amount of performance-measuring equipment installed, this may be high. King says he wishes they should not be complicated in one hour.

Morning inspections require about one hour and include a final check during test runs of the powerplants by the technician.

►Engine Difficulties—During the first 250 hours of flight time on the Comet, 12 engine changes were made, stemming from 8 different causes. It should be noted that before the Comet engines flew in the Comet, they had been subjected to much test-bed running, including altitude tests in specially adapted Lancaster and Vampire aircraft.

►Bearings—Three front bearing failures necessitated engine changes during the first few flight hours, even though there had been as much as 1000 hr on the test-bed Lancaster. Diagrams showed that lubricant was

being blown from the bearing tracks by turbulent air flowing through the (wide) bearing seals. A change in the lubrication system (in present action) into the bearing instead of out of it, removed the difficulty.

►Stator Blades—In two cases, engine changes were necessitated by damage to the blades of the turbine compressor. A dirty burner can cause the condition. With the burner choked, the other two work overtime to maintain engine speed, and load heating of the stator results in blade deformation.

The stator blades were sheared off on two occasions, changing the engine with delay.

►Oil Toolkits—A lost lock of lubrication caused the failure of a turbocharger drive gear and necessitated the eighth engine change. The crash was due to the failure (which damaged bits of metal into the engine) of a special piece of test equipment, a stroboscope drive adaptor.

An oil leak once developed a leak, and caused the tenth change, although this trouble did not require any modification to run.

Furthermore, it also should be noted that in the one engine change was made because of the possible delay in flying the plane, and not because the bearing was serious enough to demand complete replacement.

Failure of a fuel pump and brought on the eleventh change, and a design modification. Rough running caused the twelfth replacement.

►No Major Difficulties—All these troubles have been little more than the sort of significant point brought out by the listing is that the major components of the engine have given no trouble. Burner cases, for example, incur the chief cause of gas turbine difficulties, wear no problem. And no trouble was experienced with tailpipes, accessory drives, turbines, or impellers.

►Change Anti-Burner claim is that it should be possible to change an engine within the aircraft's normal traffic load period, without delaying departure more than a few minutes. Engines have been pulled by their own weight in one hour, but several previous on the Comet, loaded as it is with special gear, particularly flight-test equipment, require more time than this.

The engine is released from the axle by one toggle linkage, four clamps separate the tailpipe, which slides back out of the way on runners. Engines are freed by removing single bolts at these

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is an advantage . . .



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ports-free brass and a tie-bar.

Power control coupling is so designed that retooling power switchovers can be made without the need for adjustment, and of course, all other controls, and by double and electrical couplings lock and retoolment only.

► **Work on Running Engine**—One of the biggest improvements of gensets during the removal of the dipstick during engine runs. It has been almost impossible to approach, let alone adjust a propeller engine while it was running, now, the pet engine can be approached (running and does not get its head stuck in exhaust) and adjusted during operation. Further, the act of curving can be left open without danger of their being lost off by the prop blast.

Cause cooling can be completely opened in 30 sec., and bathed right in 2 min.

► **No Great Stakes**—The vibratory aspects of the GenSet's powerplant has been pleasing to maintenance men. Vibration don't work here, hence parts don't spring leaks, misalign and extra-stress don't go out of adjustment.

An integrated trouble which almost failed to materialize was fuel leakage from the wing integral tanks. Reflex bonding reduced the number of necessary rivets and increased the possibility of leakage. Nevertheless, a few small leaks developed which were corrected in a few hours.

► **Low Green**—Neither a single wheel gear set a huge (disastrous) landing gear has given me trouble in the dry-to-rain. Maintenance of retracting mechanisms can be handled completely from ground level.

King stated that the huge gear had been particularly trouble-free, requiring only initial adjustment of dampers, and installation of landing "fluct and toe" coefficients, all of the gear were expected but three failed to show.

Large shortcomings was removed after the landing trials because it would not retract into the space originally designed, into the GenSet for single wheel gear.

Final note on reliability is sounded by this last paragraph from Mr. King's report.

"To those who have had experience of testing modern aircraft prototypes the evidence of 250 hours of test flying is a sufficient evidence of an unusual degree of reliability and sound design. Before the GenSet left for its trip and trials in Alaska, it came into the shops for a particularly thorough and detailed inspection. The resulting 'long shag' contained ten items for adjustment. Of these only a few were corrected, and three returned to manufacturers of oil, needing the attention of a cleaning man. It's as simple as that."



One type Elitex type Pleated type

BENDIX-SKINNER DIVISION OF

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Circle 36 on Reader Service Card



Circle 36 on Reader Service Card

LETTERS

Pullman Editorial

Dear Bob,

Congratulations on your editorial in *Airline News* of June 18 ("Pullman's Voice 44"). It is splendidly done and should prove most effective.

In a small way I endeavored to assist in this also last Saturday evening when I took part in Ted Connel's American Forum of the Air television show at the Waldorf. As you probably know, the others on the program were Joe Robert (Vice of the Association of American Travelers), Chester Thompson of American Wilderness Operators and Walter Helms of the American Traveling Arts.

The point I brought out and intended to cover is quoted as follows:

"To imply for a moment that all kind of transportation is stop collecting their companies and improve their service to passengers. This is particularly apparent with regard to rail. People who try to take longer should not have shown and don't put down the South."

Again, my congratulations on your editorial.

E. S. LAMB, President
Air Transport Association of America
1147 Wisconsin Avenue, N.W.
Washington, D. C.

Dear Bob,

I have just read with much interest the editorial on page 14 of your June 30 issue. It is well written and I am glad you wrote it.

You may be interested to know that in the "Richmond News," quoted by the Association of American Railroads on the evening of June 17, the death of Martin Luther King in Memphis was one of the incidents brought to the attention of the railroad.

I agree with you that the type of advertising in it is deplorable and so we have refused from criticism. How long we can remain quiet is questionable.

I have shown him that the last argument for the status policy of air transport is the top management policy which can no more be accepted than he will accept it. As a matter of fact, we have a better top management policy on the airline.

ROBERT BAKER
Executive Vice President
Air Transport Association of America
Washington, D. C.

Dear Bob,

I appreciate your note of June 18 and am sure the editorial from your recent issue. This is most constructive and should be helpful.

W. A. FERRARO, President
United Air Lines
United Air Lines Building
Chicago 15, Ill.

Dear Bob,

Many thanks for the editorial which I think was very good. I had one of the Pullman and all space with your opinion of it.

Because of the long number of articles at railroad control, the one on the Pullman itself will have appeared if his sole and children would be killed or injured in a railroad crossing accident on track in their home.

G. T. BAKER, President
National Airlines, Inc.
Miami 44, Fla.

Dear Bob,

I think the editorial is an extremely thoughtful one and as a matter of fact, I thought of making an attack on the subject itself.

It is appalling the recent behavior of the railroads in their opposition to the Air Line. Of course, their entire program is designed to prevent the airlines from receiving the full subsidies paid to the railroads. My own contacts with the Post Office Dept. give me the impression that the railroad subsidy war will be more of \$100,000,000 a year.

The railroads threaten the passenger service that they should provide in the division for the transportation of freight, and they have more after years of service without it being needed.

I think your editorial has brought about a great deal of discussion and a number of facts did much to highlight the long being pressed by the railroads. You can be so complicated upon the fact which you did.

SEYMOUR LAMAR, President
Colonial Airlines, Inc.
212 Park Avenue
New York 17, N. Y.

I think the railroads have been too long in the past, partly constructive and it is good to have a champion to call them on it, in a straight article of the kind. The personal attitude has long followed the attitude of a confirmed writer who is critical perspective and engaged in this very space.

C. F. WILSON
President of General Motors
Piquette Air Lines, Inc.
Atlanta, Ga.

Congratulations on your excellent editorial concerning Pullman's behavior.

Personally, however, all attack is too far from the truth and the type of approach more indirectly can over additional comments for the airlines.

JOHN H. COLE, Jr.
Director of Public Relations and Advertising
Delta Air Lines, Inc.
Atlanta, Ga.

Circle is now for the head business trip in the June 18 issue of *Airline News*.

You deserve, and I am confident, will receive, the thanks of the entire aviation industry.

JOHN E. WALKER, Vice President
Boeing International Airlines
Los Angeles
Dallas, Tex.

From Golden North

In your June 4 issue, you carried a headline as follows: "Northern Star Starts Has Their Trouble." That portion... I will be in the statement in time but you listed Golden North Airways at a number of the Airline Travel Club. And we have been participating in any such club or anything resembling one that type of association.

CHARLES J. FRANK
President, Golden North Airways, Inc.
Fairfield, Alaska

Our Reply

We have the following reply from our Seattle correspondent, as collection with Mr. Frank letter:

I do not understand that Golden North was a member of the Club from on inception of the club. I remember being in contact Golden North at its Seattle phase number of the time but not as a member. No phone number is listed and also information has been, for the Airline Travel Club. Another article that was a member was the club in its efforts, then down.

Beech Speaks

I am very happy to offer our sincere thanks and our compliments to two articles in the June 12 *Airline News*.

Our thanks are due to you good coverage of our Sales Institute on "Mind Your Words," published on Page 41. This article is a excellent summary.

Our comments are due for the article on Page 14, "Let's Sell Today's Travelers." It is extremely refreshing to have a magazine of the reputation of *Airline News* make a statement of the kind. The personal attitude has long followed the attitude of a confirmed writer who is critical perspective and engaged in this very space.

Mr. Morris represents in a sound and constructive way the true line behind current personal aviation. We are extremely happy to see this article and offer our congratulations to you and through you to Mr. Morris.

JOHN P. GARY
Vice President/General Manager
Beech Aircraft Corp.
Wichita 1, Kansas

Organizing Feeders

I wish to compliment you on your editorial line of 1 reviewing a permanent organization of the feedlines. I have taken your suggestions to several aviation people. They were so kind that it is a good suggestion, and are planning on making it a part of our forthcoming 1967 American Conference here next October.

W. W. SKERRY, Jr.
TWA 500 Airways
Dallas, Texas



The Birdmen's Perch

No go too slow, too fast!

Stalls are bad enough anytime, but at low altitudes they're poison. No wonder how essential we get to the runway. It's so fun to see it coming up at us like that!

That's why we're so happy up over a



new device we used about that's going to tell like but when it's about to stall, you'll know when it's about to go into a stall. That's for us, Birdmen, and it should be for you!

Stay we can give you more info at the customer, but suggest you make some inquiries yourself. It's a car but that this little gadget is going to prevent the occurrence of loss of only three ships and plenty of pilots.

As our birds, it's a Number 1 necessity!



Gulf Oil Corporation... Gulf Refining Company...

MAKE WITH THE COMMERCIAL, PLEASE!
But if you give up, do it on the ground and in front of that fatty storage unit blue "GULF" sign!

The good-looking fellow in the control is just dying to fill your airplane with a product he's been plugging called Gulf Aviation Oil—Steen-D!

Did we say product? Why Gulf Aviation Oil—Steen-D—is particularly in a situation, the world's time demands the product oil for continuously opposed to give.

We don't want to beg, but Gulf Oil is the only aviation oil you through Gulf's exclusive Airlines process to international rates, custom and budget demands.



Great Scott, Max, get some! Increase those pounds faster, already up to 1000!

LITTLE KNOWN FACTS DEPT.

What? You never heard of Donald? Don't look, 1400 West 10th Street, Dallas, Texas!

Well, you will from now on because

Don has just moved great attention and a shiny new Casuarina of Pacific Palm (Donovan tree, of course) for his collection, with 10000, a Little Known Fact that may account for the paper shortage! To see



Wings from received for a big Air Force bomber would cover 125 feet! Indeed! Don, don't, absolutely isn't! It's fact like these don't worry our body to face! Now—a good fellow and tell the sales boys and girls how much time it is to be done.



AIR TRANSPORT Airlines Ease into Mobilization

Regular and nonscheduled operators are helping fill void caused by shortage of strategic airlift capacity.

By Charles Adams

For the second time in two years a Reassessing-impinged aviation has spotlighted the military's shortage of strategic airlift and the need for commercial equipment to fill the void.

Even sooner than in the case of Berlin's Operation Vittles, the Korean outbreak revolutionized the capabilities of the Military Air Transport Service. Several days after the start of hostilities in the Far East, seven airlines had been signed up to fly high priority passengers and cargo between the U. S. West Coast and Japan.

Other carriers were participating in the trans-Pacific operations under sub-contracts. At the start of last week, the military was looking for additional commercial equipment capable of doing the supply routes via Hawaii or the Alcan.

► Mobilization Mishmash—The limited emergency set as nation some of the aircraft industry that will be used in a full-scale mobilization of commercial airline resources becomes involved.

Coordinated action is being taken to convert inaccurate Civil Aeronautics Board promises to remove selected passenger from flights, or to cancel reservations, whenever such steps are required to meet government needs as emergency with national defense. Airline officials and the most was intended to protect the customer against damage, said by passengers who might be "bumped" to make way for military traffic.

The Air Transport Assn. emphasized that the action was to assist the equivalent of setting up a priority system for passenger travel. However, promises can be avoided almost immediately if the security agent.

► Frontier Held Off—ATA, Executive Vice President Robert Baerwick said a rapid domestic priority system not only conceptualized now because of the air line's greatly increased passenger capacity. He pointed out that the scheduled domestic routes have been turned in many places as to service as of the start of World War II and that existing capacity of each route has nearly doubled.

But defense planners were taking no chances. That a speed of the Korean trouble would catch them with their planes down. National Security Re-



LYACURES from Pan Am are used by Air America to West Coast Air Force base in part of emergency airlift.

sponse Board is whipping together final details of the airline mobilization plan proposed by the government's Air Coordinating Committee.

Agreement on local general plans for airline mobilization was obtained many weeks ago, but civilian and military reserves have shied over final details. The airlines themselves have worked out detailed plans for shifting equipment and personnel if the need arises.

► Contracts Signed—The seven commercial airlines signed up by the military for trans-Pacific flights were Pan American Airways, Northwest Airlines, United Air Lines, Transocean Air Lines, Seaboard & Western Air Lines, Flying Tiger Line and Overseas National Airways. In addition, Alaska Airlines was supplying planes and crews under sub-contract to Seaboard & West.

Initial programs called for around 42 roundtrips weekly to the Far East. With a one-day turnaround, the 10 would require around 17 planes. The military had hoped to obtain sufficient commercial equipment for 10 roundtrips daily to Japan.

Regular flights filled—Pan American and Northwest are filling each of their space on regular trans-Pacific flights with military traffic. Doubtless, the coordinated transcontinental airlines have followed suit.

During the Berlin airlift and several smaller trans-Atlantic military operations, international airlines—mainly Seaboard & Western, Transocean and Alaska Airlines—handled the bulk of the military contract traffic. Needed equipment was quickly available for the project emergency, but the coordinated airlines will probably make the biggest contribution in the long run.

Pan American, which provided comparatively little equipment in support of Operation Vittles, expanded service to the Korean case. It was transferring planes from its Latin American and African divisions to meet Pacific needs.

While several domestic and international airline schedules (except for Northwest's and PAA's flights to the Orient) were not disrupted seriously during the first two weeks of the Korean war, there were a number of repercussions.

► Equipment Shortage—All long-range, low-altitude equipment is at a premium. The Korean airlift needs planes, U. S. domestic and international carriers imply planes for the Pacific route as available to run extra services to meet peak civilian requirements on some routes.

Should airlines increasingly in the Pacific (or elsewhere) grow larger, the commercial carrier could, without such strain, make available perhaps 20 additional long-range planes by transferring flights to civilian routes when there is no emergency competition. The airline traffic boom which started last year has left a surplus of carriers with little or no equipment surplus.

American Airlines, for instance, had but then a 75 percent year-to-date load factor during June—the busiest month in its history. An additional increase in AAA's extensive load factor about the 75 percent load would probably could not get gone this year.

Northwest Airlines has been operating at near capacity ever since the Korean conflict started. Even before the war military airlift began, NWA was making regular flights from Tokyo to Anchorage carrying refugees from Korea.

► Shanty Ship Operations—Due to the emergency, Northwest was in danger of losing its base at Shantou in the Philippines because of Air Force competition. With the Coast Guard's role in the Korean emergency, Northwest, the Air Force will keep the base open for an indefinite period.

Contract carriers such as Transocean and Seaboard & Western also point to the Korean situation as further proof that their services are vital to national

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Head of the Export Department is John Loran, who has had 14 years of experience in aircraft export services. He has received his master's from a five-year trip through Latin America.

Van Dusen services overseas airlines and operators to suit their specific needs in not capital such as they can secure the most prompt, efficient shipping of fully equipped, quality supplies and equipment.

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defense. Only last month, C-47s ended the two companies to cross and clear Van Dusen's operations completed in violation of the Civil Aeronautics Act. Local insurance attorneys had contacted them the entire month and had their operating rights restored.

► **Midwestern Flies Available—Alaska Airlines**, which has three long-range DC-4s for use in the Pacific airlift, is strategically placed for operations over the Alaskan route. It has made nine, contract flights on this line before, and its maintenance base at Seattle and Anchorage was given valuable during the emergency.

California Eastern Airways, which has been leasing 10 DC-4s to non-scheduled operation, has asked CAA permission to make contracts with the military without regard to frequency or regularity of flights. Transwestern and Seaboard already have such authority for a six-month period.

CAA recently converted two of its plans to long-range DC-4s and is working on the others. Transwestern (July 20 p. 71). In addition, the company has extensive DC-4 control in cities at Oakland, Calif.

► **No Time for Deliberating—Flying Tiger Line**, when asked by the Armed Forces to provide emergency airlift services, is noted that it lacked authority from CAA. Military officials told the carrier to sign the contract and complete its delivery with CAA later. The Tiger has asked CAA authority to waive the Pacific flight rules. MATS will, in addition, reduce that under Part 43 of the Civil Air Regulations, which governs regular commercial air transportation.

Overseas National Airways, which had tried unsuccessfully to get CAA

permission to use its C-54s on trans-Pacific cargo charter flights this summer, found its long-range ships in action during the military. CNA speed \$180,000 covering its planes for overseas legs, and the CAA has had been a bad time.

► **Bigger Than Berlin—If the Korean war continues through the end of this year, the amount of commercial airlift used by the military is expected to exceed by far the capacity contracted for during the Berlin airlift.** From June 18 through Dec. 31, 1949, one-way trans-Pacific direct flights numbered 639 and brought in an estimated \$5 million revenue.

Concentration of MATS planes in the Pacific is causing military demand for commercial airlift in other areas. TWA and American Overseas Airlines were started to make more trans-Pacific flights to Germany for the Armed Forces. Pan American also flew a shipload of troops from Manila, Ala., to Puerto Rico.

Traffic Gains

Large cities account for greatest part of 1949 domestic increase.

Big cities, not the great ones, are putting the top into domestic airline traffic figures.

A recent Civil Aeronautics Administration survey shows that 92 percent of the scheduled airline's 1949 passenger traffic increase was accounted for by 50 large metropolitan areas. Although 34 additional stops were activated last year (see last of these

pages), the new airline construction was responsible for only a small fraction of the rise in scheduled domestic passengers from 13,976,000 in 1948 to 14,777,000 in 1949.

More than a third of last year's domestic gain was generated by those stations—New York, Chicago and Washington.

► **New York Leads—**The 12 certified airlines serving the New York metropolitan area made 93,393 departures last year, carrying 1,362,611 passengers, 60,24 tons of mail and 49,575 tons of cargo. These figures include traffic out of La Guardia (New York), Newark, Trenton and White Plains airports.

Chicago Municipal Airport, also served by 12 scheduled domestic airlines, reported 74,226 scheduled plane departures, 1,366,284 passengers, 7791 tons of mail and 38,495 tons of cargo last year. Washington National Airport, served by 9 domestic airlines, had 53,931 scheduled plane departures, 695,090 passengers, 2676 tons of mail and 3662 tons of cargo.

► **Los Angeles Fourth—**Other top traffic generating metropolitan areas last year were: Los Angeles (including Burbank and Long Beach), 51 scheduled carriers, 70,128 plane departures, 617,376 passengers, 6085 tons of mail and 12,316 tons of cargo; San Francisco (including Oakland), 5 scheduled carriers, 48,669 plane departures, 509,336 passengers, 3174 tons of mail and 3771 tons of cargo.

► **San Antonio, 11th—**Scheduled carriers, 27,851 plane departures, 494,711 passengers, 522 tons of mail and 5404 tons of cargo; Dallas, 6 scheduled carriers, 52,162 plane departures, 413,075 passengers, 2745 tons of mail and 5115 tons of cargo; Denver, 5 scheduled carriers, 56,101 plane departures, 499,142 passengers, 1931 tons of mail and 9125 tons of cargo.

Meanwhile, Miami was the most important traffic point last year from the standpoint of scheduled passengers. The 34 U. S. flag carriers serving Miami made 6206 plane departures in 1949, carrying 112,219 passengers, 466 tons of mail and 3816 tons of cargo.

New York's 5 U. S. flag carriers accounted for 5927 plane departures, 121,879 passengers, 1994 tons of mail and 3622 tons of cargo. Seattle replaced 30,769 passengers on U. S. international airlines last year, from 26,587. New Orleans, 17,121 and Houston, 15,072.

► **Mileage Study—**Meanwhile, a Civil Aeronautics Board study of March, 1949, traffic indicated that levels at airports actually is increased. New York accounted for 32 percent of all international traffic generated within



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MARTIN LOOKS AHEAD

Present version of the Martin 40-4 has just passed with redesign engine is shown in the sketch conception. Eastern Air Lines and TWA have this new offered a total of 68 redesigning engine 40-4s, accounting at the time for the transport

were designed to operate with the same powerful turbo-prop. One of turbo-prop in the 40-4 would reduce the initial life of the engine to less than 1000 hours, according to experts at the Martin plant. (See Industry Observer, page 13.)

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the U.S. (Miami) leadership in inter-urban passenger travel from the large number of short trips to Caribbean ports which generate comparatively low passenger loads.

GAMA's survey showed that the top 100 ports of domestic station connections produce nearly half of the total traffic for the 15,552 station combinations reported. First five domestic pairs of stations form the stronghold of passenger handled here: New York-Boston, New York-Washington, New York-Chicago, Los Angeles-San Francisco and New York-Miami in that order.

On a passenger-mile basis, the largest hubs became more important in traffic position. Top five cities in March, 1948, from the passenger-mile standpoint were: New York-Miami, New York-Los Angeles, New York-Chicago, New York-San Francisco and Chicago-Miami.

Bendix Sells More VHF-ADF Equipment

Bendix Aviation Corp. has received another available contract for receiver equipment to be used in the federal government's long-range program for improving airport navigation and landing aids.

FIREWALL QUICK DISCONNECTS



Our Type TFW Disconnect (AN-3527) meets all specifications, flame and shock of collected tests. Constructed in Chromalloy.

The block, mounted in a bolted metal, is easily removed for welding to heat, thereby insuring O.R. brought on single type plugs furnished on request.

Remember—Thermo-Durac meets all types of Aircraft and Space Thermo-Durac. Low Voltage and Automatic Oil, low heat up, better aircraft flame 100° F melt, and for your copy see:

Thermo Electric Co.
PAUL LYNN, N.J.

Latest award is for 44 very high frequency navigational radios costing a total of \$384,500. Only last month Bendix won a \$2.5-million contract for airport surveillance and precision approach aids (Aviation Week, June 16, p. 34).

► **Radio Identification**—The VHF-ADF strip enables air traffic controllers to identify a plane within range of their surveillance radar screen during communication with that plane. The ADF is linked with the scope of the surveillance radar and is activated by the VHF radio signals from the aircraft being contacted.

A line of light is drawn on the screen from the aircraft "tag" to the center of the scope. This enables the traffic controller talking to the plane to identify it with the corresponding key and position him to give the pilot proper directions for entering the landing pattern.

The ADF installations require no additional equipment stored in the aircraft, since the VHF radio transmitter already, installed on the civil aircraft automatically activates the direction finder when in use. The 44 VHF-ADF's supplied by Bendix will be installed at airports now equipped or to be equipped with surveillance radar equipment.

Connie Pressurizing

Airkontek Mfg. Co. will supply the main pressurization and air conditioning system for the new Super 7049 Constellation recently purchased by Eastern Air Lines (Aviation Week May 1). Many of the Airkontek components for the Constellation will be interchangeable with those ordered for EAL's Martin 404. The 55-hp. engine superchargers supply 55.50 lb./sq. in. of compressed air and supply low backward current rejection valves for improved efficiency.

Brazil Suspensions

(McGraw-Hill World News)

Rio de Janeiro-Santos aereo ligas (airline established after this war) have been suspended by Brazil's director of civil aeronautics for failure to maintain operation last year.

They are Varig Aerea Brasileira, Avianova Alitalia, Rede Aerea Nordestina, Varig Aerea Torresana, Varig Aerea de Santos, Aero San Paulo Aerea, and Via Lactea.

Swissair Buys DC-6s

Douglas Aircraft Co.'s partner sides of DC-6 transports are crowding the 208 mark.

Swissair has become the 18th major airline to order Swiss. The Swiss carrier

bought two of the larger, faster and heavier DC-6B models for delivery late next spring. They will be used in trans-Atlantic service between Zurich and New York.

The Swiss carrier bought total DC-6 sales to 790. Current backlog of 35 includes 14 DC-6Bs.

Operation Ali Baba

(McGraw-Hill World News)

Tel Aviv—A handful of Douglas Superchargers, operating without fuel, is now engaged in the largest engine unit in a hurry—the transfer of about 47,800 long tons to new homes in Israel.

Because of still existing tensions in the Middle East, the operation is being conducted under a virtual state blackout. The local press, which reported the aerial landings at Lydda Airport, is shunning from further mention of the huge quantities, and officials are tried to be reluctant to discuss it.

The task, code-named Operation Ali Baba, is being handled by New East Air Transport, which reportedly has five Mysteres under U. S. agency in Israel. New East has been heavily engaged in long contracts from Hong Kong, Bombay and Teheran, and a new company, Operation Magic Carpet, involving air transfer of about 40,000 tons from Vietnam to Israel.



VERTICAL BUILD-UP STAND

New vertical type build-up stand offers an easy to work simultaneously without being on their backs in climbing up on the engine. Per American World Airways, for whom Radio Manufacturing Co. of Gold, built this stand, it may 14 of them at the first American maintenance base. The new unit was said to be safer and the type for engine. The American claim the new stand cut one hour in build.

Hartman 120-volt DC relays take the sting out of electrical problems in Northrop Scorpion



Photo Courtesy Northrop Aircraft Co.

High-voltage electrical systems and space and weight—two important considerations in a high performance aircraft such as the Northrop F-40 Scorpion. But, fortunately, problems in breaking into current in the higher voltage have presented use of the more efficient 120-volt DC system.

Solution by Hartman engineers of problems concerning capacity, operation at altitude, welding of contacts and difficulties of contact, has resulted in installation of the improved equipment in the Northrop F-40. The new production version is supplied a 120-volt DC system in addition to seven 120-volt lines of four different types, the F-40 is also equipped with six 28-volt 100-amp relays of three different types.

If any problem arises DC controls, not to over to Hartman where it will be analyzed and engineered with an efficiency that comes from nearly half a century of specialization in DC control equipment.



Bussor Current Control—250 amp, 120 volts DC (USAF Spec. 34545, Type Q-1)



Overvoltage Relay—120 volts DC (USAF Spec. 33812, Type S-4)



Squibless Field Relay—120 volts DC (USAF Spec. 31801, Type H-5)



Bussor Power Relay—150 amp, 120 volts DC (Gen. Spec. 2500 amp, 120 volt)



Bussor Current Control—500 amp, 30 volts (AN-9125-2)



Air Start Relay—28 volts (AN-939-1)

Overvoltage Relay—120 volts (USAF Spec. 31281, Type E-5)

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CONNECTIONS ILLUSTRATED BY Mr. AR-6159, The Aerojet Firm, Department for connecting. Attached is which piece supply.

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✓ Those who refuse compromises with quality.

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✓ Those confused by verbal radio-Gobbledygook and unable to hear, clear, exact analysis of their problems and needs in English.

✓ Those who want and appreciate superior radio styling and individual attention.



"THE CLEAR AIR COMMERCIAL"

INVESTIGATE NOW!

Southwest Airlines Co.

1000 N. 10th Ave., Phoenix 15, Arizona

Initial lifts of immigrants from Iraq have revealed groups of about 40 men, women and children per plane. But it is believed that the 56-man plane will be modified to carry up to 140 passengers per plane, as was done in the Transatlantic transfer. The low-engine aircraft are believed to be taking off from Baghdad's old Airport and flying to Jordan via Cyprus. The planes make the trip to Cyprus in about three hours forty minutes and fly at about 7000 ft.

No figures are available as the cost of this new operation, but Major Capet is believed to have involved over \$10 million including personnel quarters for the receiving countries.

Slick Business Up

Shut. Airways has edged into the black on its transcontinental all-cargo service in a month of heavy loads carried on the usually slack month of June.

The cargo line, 2,600,000 revenue ton miles of freight last month and all its cargo volume remained the highest in the industry. Recently authorized to use loaded cargo from west to east, the line played an important part in handling June traffic. The company's 22 C-46 freighters had better than a 75 per cent load factor in the month.

The Kerosene unit was expected to keep Shuck's coast-to-coast cargo business at a high level for some time to come. In addition, the company is proud new government contracts for mediation and overhaul of military aircraft.

SHORTLENS

✓ Air Line Pilots Assn.—It opposing legislation now pending in Congress which would provide \$12.5 million for testing jet and turboprop transport prototypes. ALPA doesn't want the Civil Aeronautics Administration and Commerce Dept. to improve the program. It says the testing should be done by a nonpartisan independent air safety board.

✓ All Airlines—Carried a record 15,000 passengers in May and June last year among the 17 certified airlines in the passenger traffic category. Com. gov't employee organization, the "Triple A Club," has indicated a stock purchase plan for members. The club will buy AAA common stock in lots of 100 shares to provide savings on price and brokerage fees.

✓ Customs—The general machine a 3-circuit air size (model 100) is attractive to May 1, with an additional 2 cents effective May 1, 1951, to May 1, 1952.

✓ Delta—Low 22,044,000 revenue passenger miles in May compared with 22,716,000 in the same month last year. Load factor rose from 54.9 to 57.6 percent.

✓ Flying Ties—The received special CAB permission to operate around-the-world flight this summer carrying members of Youth Agency, a nonprofit, educational organization. Pan American Airways opposed the application.

✓ Frontier Airlines—Planned to start service between Phoenix, Ariz., and El Paso, Tex., via Salt Lake, Ariz., and Longhorn, Texas, and Los Angeles, N. M., around July 15.

✓ Inter-American Safety Council—Provided its aviation award to 21 scheduled airlines which operated 1,279,811,000 passenger miles in the Caribbean area, Mexico, Central and South America last year without an accident or fatality to passengers on any of the airlines. The Council also presented a special citation for operating a record of 16 years without a serious accident or fatality.

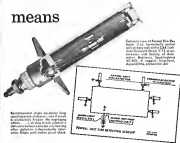
✓ ICAO—Fourth session of the International Civil Aviation Organization's Assembly, which met recently in Montreal, refused to amend the ICAO charter so that the organization's governing headquarters could be moved from Montreal.

✓ MSA Conference—Line traffic was the last in MSA history. The company carried 18,723 passengers in comparison to 22,034 during the same month last year.

✓ Mt. McKinley Airways—CAB has denied the Anchorage, Alaska, company's application for an individual exemption as an irregular carrier. The Board stated that Mt. McKinley's unscheduled letter of registration was voided in May for licensing and civil violations of the Civil Aeronautics Act and that the company had demonstrated such a disregard for CAB's economic regulations as the part that it should not be repeated with future authority to render irregular service.

✓ New England Air Express—CAB has suspended, pending an investigation, the carrier's proposed \$50 fare between Boston, Calif., and Providence, N. J. The Board said the low fare might be unjust as unreasonable. CAB also suspended a proposed \$52 Seattle-Anchorage fare filed by Air Transport Association, another suspended. The Air Transport Association protested against the latter fare.

Airline after airline is learning what positive fire detection means



Resistor-type single air detector type... (text is small and partially obscured)



The Fenwal Aircraft Fire Detector has been designed for positive detection of fire or dangerous overheat conditions. The unit combines the best features of rate of rise and fixed temperature devices.

Fenwal Fire Detectors are permanently calibrated, her-

metically sealed stainless steel units. Easy to install; single terminal runs out connection errors. No bulky panels, relays, supervisory instrumentation to buy or maintain.

Fenwal, Incorporated, 135 Pleasant Street, Ashland, Massachusetts.

Further information on request

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YEAR-ROUND CONTACT EXPERIENCE

THERMOSWITCH®

"Big 3" For CP

Aircraft Fire and Over-Heat Detectors

SENSITIVE...but only to heat

Showing Up The Scoffers

One of the purposes of the Civil Aeronautics Act of 1938 was to end national defense. This is a major reason commercial air transportation received a few more generous benefits from the government than other national transportation modes.

The railroad has always held that national defense was merely to ensure the railroad had behind to justify "subsidies."

So we are happy to refer the scoffers to our story in this issue. Despite the several limited big transport aircraft they already operate, the military services had contracted with *union airlines* to fly high-priority men and materials within a few days after the outbreak of the Korean crisis.

And, in our opinion, you haven't seen anything yet. Shortage of air transport over the Pacific is barely beginning.

When we must get things done fast, we ask for airplanes first.

A "Square Deal" For The Rails

Several of our gentler readers either question our opinions of the railroad's publicity and advertising, or ask us to do some real thinking about fair play.

One reader refers to a piece in the July Reader Digest under the appealing title, "All the Railroads Want Is a Fair Deal!" He adds, "Obviously, in your position you would have colored thinking and writing difficulty." The extent of bias, if any, is what I would like to determine.

Dear Skeptical Reader:

What could appear more to the American sense of fair play than to correct plea that the railroad get a square deal. The article in question says the rails are being "bugged incessantly by competition subsidized by the taxpayer." Even the government is competing by means of parcel post which is operated at a financial loss to the taxpayer.

What is the railroad's idea of a fair deal? Virtuously, they don't want subsidies. "All we ask is an opportunity to compete with other forms of transportation on a basis where each is paying all his own costs and not passing them along to the public in taxes. Instead of a subsidy, the railroad wants their competitors' subsidies channelled."

Now, we have objected to some of the railroad advertisements and public statements because we think some of them have been untrue or misleading or unethical. First, however, let it be said again that we hold no hard or excessive subsidies anywhere—whatever definition of the word subsidy is finally agreed upon. We hope Congress makes commercial aviation stand more and more on its own feet.

However, we can find no one to stop with our simple thesis that it was Congress that passed the laws which

created the conditions that the airlines, bus lines, truck lines and the railroads operate under today. It seems a little late for the rails to be waking up now to the Civil Aeronautics Act of 1938, but perhaps this is a hard thought coming in how to forget it.

If the rails, and their closely allied Pullman Company, don't really want to serve or share the public into not using planes, trucks and buses, and if all they want is a revised set of "subsidy" circumstances, then let them go to Congress, tell Congress what they want and need, and take the chances the rest of us take when we are supporting new legislation.

Finally, and this may be late, we just don't see how the rail-air-airline act advancing in one way or another to the point of flight, or the air-truck act about highway competition, be in with a direct campaign for getting a square deal on subsidies.

It's up to Congress. Why don't they ask Congress to "pass a law?" Our biased guess is that the public is well satisfied with bus, truck and air service to risk getting it cut back to where railroad service was before the rails had all this "subsidized competition."

Better Than A Hurricane

Remember the hurricane of 1938? It knocked out all ground transportation between New York and Boston for several days. If anyone made that trip during that period, he flew.

Literally hundreds of persons who had never flown before suddenly found themselves on DC-3s safely by passing the conditions before and getting to their destination in a fraction of the time they had planned to spend on trains.

After the emergency, airline men marveled at the way their traffic held up between New York and Boston. Actually, it never did drop off again to pre-hurricane levels.

Last May the well advertised threat of a crippling railroad strike stopped up airline traffic to something like hurricane status. The Wall St. Journal afterwards reported the air carriers' business was still up in the Chicago area and expressed the opinion that during the strike the airlines had won some new friends permanently.

The few cash fares are outdoing hurricanes and strikes. There are no accurate figures on the number of converts but the number is larger than at any previous time in airline history.

This ability of the air coach fare to wade against's ebbs and flows and new customers is far more important than any month-to-month passenger statistics. A satisfied customer is likely to be a customer the rest of his life. The biggest selling job has been accomplished.

When the railroads take to aviation as easily as to bus, train and truck, aviation will be mass transportation. Only as mass transportation can aviation reach its maximum efficiency and economy.

—ROBERT H. WOOD

Shooting a bird...

IN THE AIR AGE

This is "shooting a bird" at the U.S. Naval Air Missile Test Center, Point Mugu, California.

The "shoot" is the launching of a missile, while the "bird," in this particular case, is the Fairchild CTY-N-3 guided missile.

In a matter of seconds the missile is hurled high into the atmosphere with a *defining* roar, propelled by its reaction-type engines and auxiliary booster separation of the booster occurs as the missile speeds higher and higher into space, stabilized and controlled by the "intelligence" of its electronic guidance systems.

Soon the launching crew and ground observers no longer see the missile... but its path is being carefully plotted as it hurtles toward its target... now under its own homing control.

This "shooting a bird" is but one phase of the Lard project. It is an operation requiring split-second timing and perfect coordination. It is the result of teamwork between the Bureau of Aeronautics, Navy Department, the Naval Research Laboratory, and Fairchild engineers and represents a combination of the best in aeronautical design, electronic controls and precision manufacturing.

Here is another example of a Fairchild job and of "shooting a bird"... in the Air Age.



FAIRCHILD ENGINE AND AIRPLANE CORPORATION
FAIRCHILD
Guided Missiles Division
FARMINGDALE LONG ISLAND, N. Y.



3 TONS A MINUTE...

... of air pours through this intake when the new North American F-95 is flying top speed. Yet the J47 turbojet inside handles this easily and operates reliably, efficiently, and without vibration.

The Air Force's newest interceptor, a stablemate of the speed record-holding North American F-86, is designed for the high speed, high-altitude flight necessary to knock down enemy fighters and bombers. Teamed together, the F-86 and F-95 provide both offensive and defensive air power. Both use General Electric J47 turbojets for high performance under tough conditions.

As the G-E TG-190, this same engine has been certified by the CAA as the first axial-flow turbojet suitable for commercial use. In tomorrow's commercial transports, the TG-190 can provide the same speed, comfort, and dependability that are today built into the fastest and most powerful Air Force planes.

And in addition to the powerplant, General Electric also provides integrated engineering service that assures you of co-ordinated propulsion and electrical systems. From the designer's drawing board to the far-flung outposts of operational aircraft, General Electric's aviation experts can help you. Call your nearest G-E sales representative or write Apparatus Department, General Electric Company, Schenectady 5, New York.



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